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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,427	12/03/2003	Shuichi Ezaki	117965	4777

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EXAMINER

CHANG, CHING

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 10/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,427

Applicant(s)

EZAKI ET AL.

Examiner

Ching Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5 and 7-31 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 12-15, and 21-30 is/are rejected.
- 7) ☒ Claim(s) 8-11, and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the amendment filed on 08/10/2006. Claims 4, and 6 are cancelled, and claims 16-20 are withdrawn as requested.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. ***Claims 1-3, 7, 15, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al. (US Patent 5,327,856) in view of Ogiso et al. (JP '661).***

Schroeder discloses a valve-driving system (See Figs. 12-13) which is applied to an internal combustion engine having a plurality of cylinders for driving an intake or exhaust valve (18) provided in each cylinder (corresponding to 14), comprising a plurality of valve-driving apparatuses (10, 16), each of which is provided for at least each one of the intake valve and the exhaust valve, wherein each valve-driving apparatus comprises: an electrical motor (10; 88) as a driving source for generating rotation motion; and a power transmission mechanism (16; 86) for converting the rotation motion of the electric motor into opening and closing motion of the valve to be driven and for transmitting the opening and closing motion to the valve through a cam (24; 24'; 24'') or a link (84, 86); wherein each cylinder is independently provided with the valve-driving apparatus (See ABSTRACT); wherein the intake valve and the exhaust

valve of each cylinder are respectively provided with the valve-driving apparatuses independently; wherein an entire periphery of a contour of the cam comprises a projecting curve surface; wherein at least a portion of the electric motor is exposed from an external upper surface of a head cover (part of 12) of the internal combustion engine; wherein the electric motor is taken out from the head cover of the internal combustion engine and is disposed on an upper surface of the head cover; wherein the internal combustion engine is mounted in the vehicle in a state that the arrangement direction of the plurality of cylinders coincides with the lateral direction of the vehicle, and that a cylinder head is located forward of a crank chamber.

The Schroeder device discloses the invention, however, fails to disclose the said apparatus further comprising a torque fluctuation suppressing mechanism.

The patent to Suzuki on the other hand, teaches that it is conventional in the engine vibration suppressing art, to utilize a torque fluctuation suppressing mechanism (90, 100; Fig. 3) for eliminating a cranking-caused vibration.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the torque fluctuation suppressing mechanism as taught by Suzuki in the Schroeder device, since the use thereof would provide an improved rotating balanced engine valve driving system, for a smooth engine operation.

3. Claims 1-3, 7, 15, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blish et al. (US Patent 5,331,931) in view of Suzuki (US Patent 6,739,299).

Blish discloses a valve-driving system (See Fig. 1) which is applied to an internal combustion engine (10) having a plurality of cylinders for driving an intake (26) or exhaust valve (31) provided in each cylinder (14), comprising a plurality of valve-driving apparatuses (See Figs. 1-2), each of which is provided for at least each one of the intake valve and the exhaust valve, wherein each valve-driving apparatus comprises: an electrical motor (40) as a driving source for generating rotation motion; and a power transmission mechanism (42, 22, 23, 25) for converting the rotation motion of the electric motor into opening and closing motion of the valve to be driven and for transmitting the opening and closing motion to the valve through a cam (22) or a link; wherein each cylinder is independently provided with the valve-driving apparatus; wherein the intake valve and the exhaust valve of each cylinder are respectively provided with the valve-driving apparatuses independently; wherein the power transmission mechanism converts the rotation motion of the electric motor into the opening and closing motion utilizing the cam; wherein an entire periphery of a contour of the cam comprises a projecting curve surface; wherein at least a portion of the electric motor is exposed from an external upper surface of a head cover of the internal combustion engine; wherein the electric motor is taken out from the head cover of the internal combustion engine and is disposed on an upper surface of the head cover; wherein the internal combustion engine is mounted in the vehicle in a state that the

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arrangement direction of the plurality of cylinders coincides with the lateral direction of the vehicle, and that a cylinder head is located forward of a crank chamber.

Blish discloses the invention as recited above, however, fails to disclose the said apparatus further comprising a torque fluctuation suppressing mechanism.

The patent to Suzuki on the other hand, teaches that it is conventional in the engine vibration suppressing art, to utilize a torque fluctuation suppressing mechanism (90, 100; see Fig. 3) for eliminating a cranking-caused vibration.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the torque fluctuation suppressing mechanism as taught by Suzuki in the Blish device, since the use thereof would provide an improved rotating balanced engine valve driving system, for a smooth engine operation.

4. ***Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki (as applied to claim 1 above), and further in view of Akeda et al. (JP '326).***

The modified Schroeder device discloses the invention, however, fails to disclose the rotation shaft of the cam being provided with a balance adjusting device.

The patent to Akeda on the other hand, teaches that it is conventional in the camshaft rotation balance art, to utilize a balance device (3) for a rotating camshaft (1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the balance device for a rotating camshaft as taught by Akeda in the modified Schroeder device, since the use thereof would provide a better rotating balanced engine valve driving system.

5. ***Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki (as applied to claim 1 above) and further in view of Fulks et al. (US 6,324,845).***

The modified Schroeder device discloses the invention, however, fails to disclose the electric motor being utilized as a driving source of an air pressure adjusting pump.

The patent to Fulks on the other hand, teaches that it is conventional in the vehicle brake booster art, to utilize an electric motor (60) to drive an air pressure adjusting pump (62, 72, 80) for a vehicle brake booster (20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the electric motor to drive an air pressure adjusting pump for a vehicle brake booster as taught by Fulks in the modified Schroeder device, since the use thereof would provide more integrated and multiple functioned engine valve driving system.

6. ***Claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki (as applied to claim 1 above), and further in view of Ota et al. (JP '364).***

The modified Schroeder device discloses the invention, however, fails to disclose a cooling water passage being provided around the electric motor.

The patent to Ota on the other hand, teaches that it is conventional in the hybrid electric vehicle art, to utilize a cooling water passage (180) branched from a main radiator (130), to cool down an electric motor (120).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized cooling water passage for the electric motor as taught by Ota in the modified Schroeder device, since the use thereof would provide a low cost and more integrated engine valve driving system.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki (as applied to claim 1 above), and further in view of Shimizu et al. (US Patent 6,425,357).

The modified Schroeder discloses the invention, however, fails to disclose the said apparatus comprising a valve-characteristics adjusting mechanism.

The patent to Shimizu on the other hand, teaches that it is conventional in the engine valve variable drive mechanism art, to utilize a valve-characteristics adjusting mechanism (120; Figs. 19-21) which changes a correlation between a phase of the cam and at least one of a lift amount and an operation angle of the valve.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the valve-characteristics adjusting mechanism as taught by Shimizu in the modified Schroeder device, since the use thereof would provide a more flexibly operated engine valve driving apparatus.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki, further in view of Akeda (as applied to claim 12 above), and further in view of Anderson et al. (US Patent 6,473,964).

The modified Schroeder device discloses the invention, however, fails to disclose the cam being used as a balance adjusting device for the camshaft.

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The patent to Anderson on the other hand, teaches that it is conventional in the camshaft fabricating art, to utilize a cam as a balance adjusting device for a rotating camshaft (See Fig. 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the cam as a balance adjusting device for a rotating camshaft as taught by Anderson in the modified Schroeder device, since the use thereof would provide a better rotating balanced engine valve driving system.

9. ***Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder in view of Suzuki, further in view of Akeda, further in view of Anderson (as applied to claim 13 above), and further in view of Hirakawa (WO '864).***

The modified Schroeder device discloses the invention, however, fails to disclose a hole being provided to the cam nose section as an oil-supply hole to the cam.

The patent to Hirakawa on the other hand, teaches that it is conventional in the camshaft lubrication art, to utilize a hole (14) in the cam lobe, in order to provide the camshaft lubrication.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the lubrication hole in the cam lobe as taught by Hirakawa in the modified Schroeder device, since the use thereof would provide a better lubricated and rotating balanced engine valve driving system.

Allowable Subject Matter

10. Claims 8-11, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments filed on 08/10/2006 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, regarding the 35 USC 103(a) rejection to claim 1, either Schroeder reference or the Blish reference has disclosed the elements and limitations of a valve-driving apparatus, except a torque fluctuation suppressing mechanism which suppresses fluctuation in torque which is applied to the cam from the valve side. The Examiner disagrees with the Attorney's contention " Suzuki does not teach a torque fluctuation mechanism that is applied to the cam and provided to the valve-driving apparatus " (See lines 8-10 of Page 9, Attorney's REMARKS). As a matter of fact, the Suzuki reference has a teaching of using a torque

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fluctuation suppressing mechanism (90, 100, Fig. 3), through the electric motor (60) and the crankshaft, to suppress fluctuations in resistance torque against an engine cranking, part of the resistance torque is coming from compression of intake air, since the cause of the intake air movement within an engine, is the interactions among the components of an engine valve –driving system, which includes the crankshaft, camshafts, cams, pistons, and engine valves, etc. Accordingly, the Examiner deems that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the torque fluctuation suppressing mechanism as taught by Suzuki, which would suppress fluctuation in torque which is applied to the cam from the valve side, in either one of the Schroeder device or Blish device, since the use thereof would provide an improved rotating balanced engine valve driving system, for a smooth engine operation

Conclusion

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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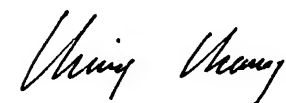
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ching Chang whose telephone number is (571)272-4857. The examiner can normally be reached on M-Th, 7:00 AM -5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patent Examiner



Ching Chang